

Bees

The best way of taking the sting from a bee, is to catch it on a piece of soft leather. The bee flies off & the whole sting will be left behind. It should then be examined under the microscope. The sting will be seen to consist of a long dart in the groove of which lie the two lancets. If the sting is only a slight one these do not enter the wound - but the bee has the power of thrusting the lancets down into the entrance made by the dart & the saw-like tips prevent them from coming out. Pouch-shaped feelers by the side of the dart, & covered with hairs, are used by the bee before it stings. Muscles attached to the dart communicate with the liver & a membranous tube leads from the poison bag to the lancets. The whole of this apparatus is drawn into the last two plates in the body.

The Hymenoptera include bees, wasps, ants, ichneumon-flies, saw-flies, gall-flies & their allies. There are mandibulate insects - i.e. those having mouthparts formed for biting & suction.

Characteristics - four membranous wings.

Small size of pro-thorax. Most of the females possess stings useful for many purposes & all undergo the changes of egg, larva, pupa & insect. Tribe Aculeata - Social insects, males, females & worker neuter. The egg-placer is modified into a sting & the larva are footless grubs. To this tribe belong - honey bees, bumble bees.

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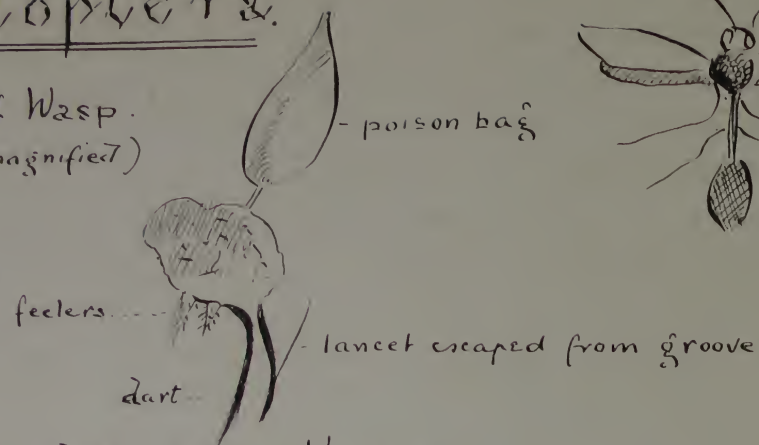
Bombus lucorum & *Bombus muscorum*. The wild bee makes its nest in a deserted mouse-hole. The *B. Muscorum* makes its nest in mossy banks or walls. The female hibernates & in spring hunts for its nest in a dome of moss, lined inside with wax. In the ovary cells ~~are placed~~ ^{are made of} brown wax in which is placed a ball of pollen & honey, as food for the young. When fully grown the larva spin cocoons from which issue only worker bees.

Bombus lapidarius - Stone Bumble Bee - orange red-tail. This fertilises the common red clover. By reason of its long proboscis it can get honey from the flower without biting through the tube. Attempts have been made to introduce this insect into Australia.

Solitary Bees The Leaf Cutter Bee bites out little pieces from Rose & Poppy leaves - it lines its underground nest with these - In the nest it deposits its egg & food stuff - Sometimes a parasitic fly comes in & lays its egg. The larva issuing therefrom feeds upon the egg & food stuff of the bee. Hoop Shaver This bee shaves off the hairy covering of the Campanion to line its nest with (filbert white). It is found on a sunny bank or dry sandy soil are Mason & Leaf cutter bees.

Diptoptera.

Sting of Wasp.
(highly magnified)



Eumenes
Coarctata

Social and Solitary Wasps.

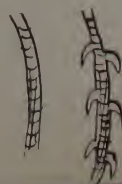
Vespa Vulgaris. Common wasp - only too well known. Early in the spring a few solitary females are seen hunting on banks & hedges for a suitable spot to form a colony. Probably decides in the end upon a deserted mouse-hole. The first gubs form working wasps, which are all neuter.

In this country we have other members of the family Vespidae - The Hornet (Vespa Crabro) & the Wood Wasp (Vespa Sylvestris). The hornet usually builds its nest in hollow trees - it consists of tiers of brown paper cells separated by short thick pillars.

The Wood wasp suspends its nest from branches of trees. The entire colony is encased in layers of paper as protection from the weather.

Solitary Wasps. Eumenidae

Odynerus parietum = Wall wasp. Found on sunny banks & walls or bramble stem. Beautiful cells are found in hollow stems & in cut open reeds.



There are not so many solitary wasps as bees. The wasp sting is on the same principle as the bees. The Humble Bee however has a curved sting, whereas the wasp's is straight. It is of great importance to the owner.

Crabronidae. Crabro Cribrarius

The family Crabronidae or sand wasps are well represented. There are 30 species or more - of which C.C. is the largest. Such families confine themselves to one kind of food. They vary in colour & markings - they are black, or black & yellow, or black with a red base to the abdomen.

Pompilus Fuscus 1/2 long & black.

The first 3 segments of the abdomen are red banded with black. - A burrower in sandy places.

All wasps are insect feeders - omnivorous.

The solitary wasp paralyzes its food with the sting. Those thin-skinned are slightly stung - horny food is stung to death. The exterior has to be allowed to soften.

Books of reference - "Workers without Wage" E. Carrington
Ants, Bees & Wasps - Sir S. Lubbock.

One of the most curious of solitary wasps is Eumenes Coarctata.

Pitcher Plants.

The "Darlingtonia" is a Marsh plant discovered 50 years ago in the Sierra Nevada (S. America) but it was not until 1855 that the plant was introduced as Darlingtonia Californica. The flowers are large & strange & the leaves rise in clumps to 12 or 18 inches high, they are slender tubes extending upwards like organ pipes, but re-curved into a hood or helmet which is brightly splashed with red. The small opening is concealed by gaily-banded banners like streamers. A curved pathway runs upwards to this from the ground, the edge being incurved all the way, making an easy entrance to destruction for the insects. If a pitcher plant is slit open a million of moneyed corpses is brought to light.



Leaf of Darlingtonia

Helmet, with
translucent spaces
letting in the light

Streamers {



Darlingtonia

11 p 71 (p) p 102 71

The Sarracenia is a native from Florida to Canada. (diagram from Madagascar) The hollow leaves are trumpet-shaped & open widely to the sky. The lid corresponds to the perianth of the Darlingtonia, which is much more developed in the leaf. The flower of the Sarracenia is solitary, it has a long stalk & dull red petals with a very dilated style. It keeps its victims by means of deeply incurved margins. The insect sees the light above through translucent window-spaces & tries to get out through the lid thus missing the real opening.

The Sarracenia has drops of nectar running down into the pitcher & within is a coating of fine stiff hairs.

In the Sarracenia Purpurea the nectaries have to be reached by descent & for this purpose the hairs all slope downwards - an insect as large as a wasp or blue-bottle can be detained by these. In their normal state pitcher plants secrete a fluid which has fatal properties. Eggs are sometimes laid by the American blue-bottle on the edge of the plant that the young may eat the refuse. Spiders also spin webs over the openings.

The Nepenthes (pitcher plts proper) are widely scattered over the oriental tropics - the best quarters being in the Malay Archipelago

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& northwards into Cochin China. In all the species the pitcher is borne at the end of a long tendril-like prolongation of leaf. it varies from an inch to a foot or more in length. Two varieties occur in many species; the first is associated with the lower leaves and developed during the youngest stage of the plant. it is not uncommonly found resting on the ground. Its form is short & broad, with broad external wing-like prolongations forming a pathway for the insects.

The Adult form is longer & narrower with external wing-like appendages less developed or absent (no longer required for insects without wings). The anterior of the leaf stands well open, being no longer of use unless to throw off rain or, being baited with nectar, to entrap insects. The rim has a fluted surface & is turned in & down thus strengthening the mouth & keeping it open. The insect is easily led over the verge & tastes the fluid secreted in a row of flask-shaped glands along the very edge of the low in-curved rim. This fluid has great irritating properties & consists of oxalic, & citric acid, chloride of Potassium, carbonate of soda & magnesia. It is known as Azerine

*
disputed

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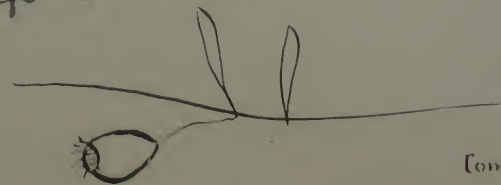


Nepenthes

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As in the Sundew the wings of the insect become instantly saturated so that it cannot fly away. Some pitchers are so large that small birds can be captured by the hooks projecting from the lid of the trap.

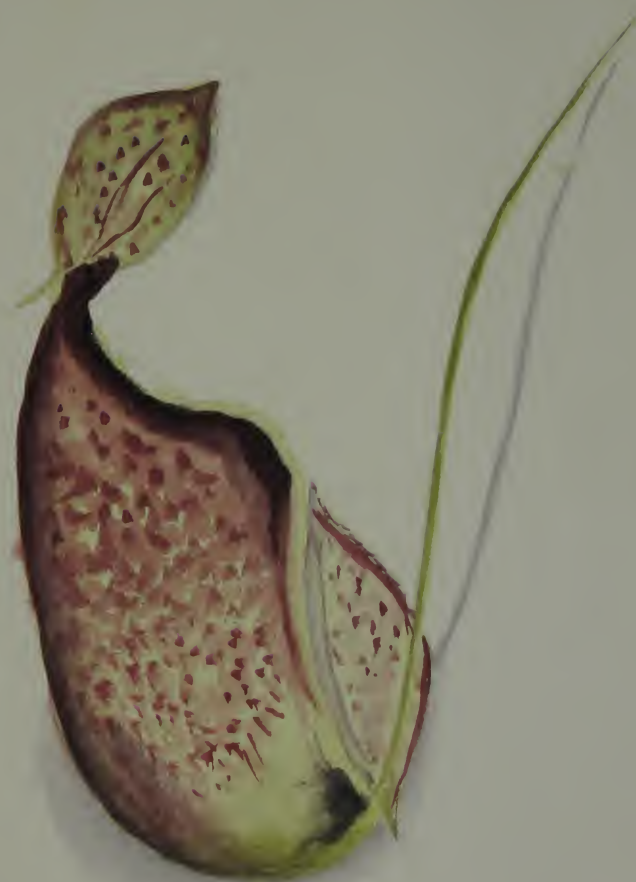
We have a little pitcher plant which is a native of Britain viz. the Bladderwort (*Utricularia vulgaris*) It is found in streams & has a floating stem, for a month or two in summer it puts forth little golden blossoms, orchid-like in appearance, but akin to the primrose which represents its ancestral form as lilies do orchids, or potatoes blossoms fox gloves & snapdragons. It has no root, but the straggling stem has numerous much divided slender leaves from which little tiny pitchers are formed. Each bladder is a simple trap, consisting of a hollow chamber $\frac{1}{10}$ inch in length & entered by a thin door or valve which shuts instantly against a thickened projection or collar round the mouth. Water fleas are the principal victims.



Common Bladderwort.



Nepenthes

Nepenthes
(young form)

Snails & Slugs.

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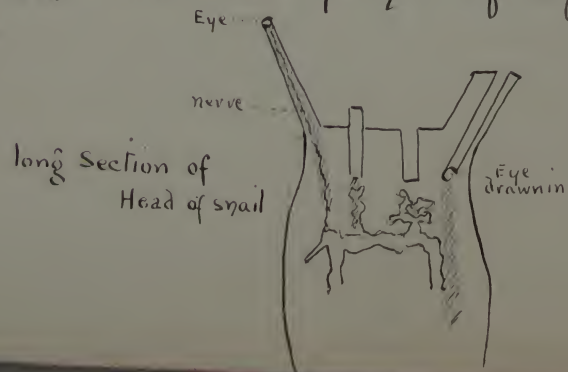
Both land molluscs - all heads bearing & breathe through a lung directly connected with the open air. On the right side of the slug may be seen a round hole which leads into the lung. The same hole is in the snail situated under the lip of the shell. The part of the snail going round the edge of the shell is the collar. The sliminess of the snail is owing to a secretion - mucus - because it is impossible for them to live with a dry skin. Snails hibernate & protect the mouth of the shell by a skin with a hole in it.

Slugs descending from a height spin a thread of mucus, which often hardens in the air before they can reach their destination.

The horny part (operculum) of the penicillate corresponds to the skin over hibernating snails.

The Black slug (*Arion ater*) has a little shell under its skin on the neck. Another grey slug (*Testacerta*) has its shell on the outside of its tail.

The eyes of the snail can be drawn in when touched like the fingers of a glove turned inside out.



Eating apparatus
Tooth Ribbon
penicillate

Section of Tooth Ribbon
chrysalis

See it on p. 100 & 101 (p. 101) (p. 102) (p. 103) (p. 104) (p. 105) (p. 106) (p. 107) (p. 108) (p. 109) (p. 110) (p. 111) (p. 112) (p. 113) (p. 114) (p. 115) (p. 116) (p. 117) (p. 118) (p. 119) (p. 120) (p. 121) (p. 122) (p. 123) (p. 124) (p. 125) (p. 126) (p. 127) (p. 128) (p. 129) (p. 130) (p. 131) (p. 132) (p. 133) (p. 134) (p. 135) (p. 136) (p. 137) (p. 138) (p. 139) (p. 140) (p. 141) (p. 142) (p. 143) (p. 144) (p. 145) (p. 146) (p. 147) (p. 148) (p. 149) (p. 150) (p. 151) (p. 152) (p. 153) (p. 154) (p. 155) (p. 156) (p. 157) (p. 158) (p. 159) (p. 160) (p. 161) (p. 162) (p. 163) (p. 164) (p. 165) (p. 166) (p. 167) (p. 168) (p. 169) (p. 170) (p. 171) (p. 172) (p. 173) (p. 174) (p. 175) (p. 176) (p. 177) (p. 178) (p. 179) (p. 180) (p. 181) (p. 182) (p. 183) (p. 184) (p. 185) (p. 186) (p. 187) (p. 188) (p. 189) (p. 190) (p. 191) (p. 192) (p. 193) (p. 194) (p. 195) (p. 196) (p. 197) (p. 198) (p. 199) (p. 200) (p. 201) (p. 202) (p. 203) (p. 204) (p. 205) (p. 206) (p. 207) (p. 208) (p. 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78 Helix Lapsicida - Stone Celler Snail - Found in cracks
 & stone places.

Clausilia vidua, Laminated Clove Shell - almost
 always found on Beech trees - the twists almost
 exactly reproduce Beech lvs, especially in Spring
 when the edges of the lvs drop off. The mouth
 is on the left side - it is provided with a little
 trap door to keep out insects; which shuts when
 the snail is inside.

Bulimus Aeneus - Banded Twist Shell - Found
 on sandy pastures in W. of England - Wales &
 Scotland.

Cyclostoma Viegans Elegant Cicer Shell - Pale grey
 tinged with violet. This is one of the few British
 snails that has an operculum which it carries on
 its back & having withdrawn into its shell, shuts
 the little door. It is found on chalky hills.

Hydra

This is a low form of animal life. It may be found hanging down from duckweed. Its body is a hollow cylinder with a number of tentacles surrounding the mouth, which are also hollow. Its whole surface including tentacles, is covered with tiny elevations, which enclose thread cells containing irritating bodies, supposed to have the power of stinging animals, for which reason it is included in the order Ctenophores. It feeds voraciously on water fleas & other small animals, which are forced into the cavity of its body. All that is nice is digested, the remainder is ejected. Animals two or three times larger than itself are caught & are squeezed into its distensible stomach, although its tentacles are often broken off in the struggle. It is still an open question whether the little elevations contain stings or not. Some say they have them at their prey others deny this. Baker describes how they seize their prey with one tentacle & carefully surround

It contracts this tentacle & brings the prey within reach of the others. Finally clasping it tightly they devour it.

Reproduction

- The hydra reproduces itself in three ways.
1. By Budding. Young ones form on the side at the rate of 20 per month. As soon as a young one is formed it catches food for itself, before it detaches itself from the parent. This is a summer process.
 2. By means of eggs. This is a winter process.
 3. It contracts & forms a jelly matrix & young ones are formed inside, after which the skin bursts & frees the little ones.
- Its powers of reproduction are marvellous. It has been discovered that if its body is cut in any direction & into many pieces, each piece would form a perfect hydra.
- If the creature is wounded young ones spring from the injured side. If two pieces are joined they will form one. There are 3 varieties.
- (1) Green with shorter tentacles.
 - (2) Red with from 6 to 8 tentacles.
 - (3) Orange brown with more delicate tentacles from 4 to 8.

80 81
Melicerla Pinigra

This animal belongs to the rotifers.
They are supplied with expanded discs round
the mouth, fringed with cilia, which sweep
the prey into the mouth. It lives in a sort
of house, which it builds up with the mud
from the ponds it inhabits. Kützky gives a
charming description of them in Water Babies



Hydra Vulgaris

Ap 81 p 251/62

Ap 82 p 251/62



Hydra Viridis



Melicerla Ringens

How to make a Water Aquarium.

Procure a bell glass - from 1 to 2 ft in diameter. Invert this into a wooden stand & place in some secure table near a window with a north aspect. Thoroughly wash some small shingle & put it into the glass to the depth of 3 inches - upon that put about 1-inch of well-washed sand. The pond-weeds must be put in next before the live stock.

The American & Common pond-weeds are good for the purpose. These can be hooked out with ordinary weed-hooks. X & will be found in any stagnant pond. Tie stones to the ends of these and see that they sink well down in the sand in the glass. Then gently fill with clear soft water to within an inch of the top. Leave it then for a few days to settle. The weed will very soon become covered with bubbles of oxygen. For getting live things from ponds use an ordinary glass jam-pot with a string handle across the top. It is necessary to consider what things will live together for some. e.g. The larva of the Dragon-fly are very voracious & would

devour the other inhabitants of the Aquarium in a very short time. The sp. net has meshes too large for purposes of pond-fishing so it should be lined with muslin or cheese-cloth. A more expensive net may be made of bamboo cane & brass wire. The wire Y-shaped is inserted into the cane while the two upper ends are fastened to or inserted into another slender piece of cane to which the net may be fastened.

Nets are very good specimens to have.

They are found in ponds covered with duck-weed, but as they are obliged to come up to breathe their presence will soon be discovered - one day on this edge - one day on that - When in the larval stage they breathe through gills & do not rise. Some nets are very handsome - black & bright yellow or orange underneath. The male net has a fin along his back & has a rough skin. The female is quite smooth & has no fin. They are from 4 to 6 or 8 in. in length. When the nets are safe in the aquarium put a piece of perforated zinc on the top & put in the water round flat pieces of cork - the nets will come up to breathe & will sit upon them.

86 Put in with them a handful of clean duckweed
for them to find water insects in upon which
they feed. In a day or two they will change
their skins. They turn them completely inside
out & generally eat them. In the spring the
newt lays its eggs & rolls them up in leaves
joined together by a kind of gummy secretion.
If there is too much vegetable life in the glass,
the water gets muddy & a kind of film forms
all over it. To keep the glass clean get fresh-
water snails which will eat the Protozoans,
which causes this film. If there is too much
animal life, the water gets bad & murex will
cover the sand at the bottom.

How to keep it fresh. To empty the aquarium
put in an india-rubber tube with one end
in a pail outside - or if required to empty it grad-
ually hold the tube in the water. pour a little
water down to start the upward flow & then as the
water spurts out move the end of the tube over
anything in the glass that requires removal it
will be drawn up by suction.

Fresh water mussels & trumpet snails will be
suitable to keep, also little minnows, carp
& small gold fish, or sticklebacks - but the

87 (also must not be mixed with other things.
If duckweed be constantly supplied no
^{other} fresh food will be necessary. Small water
beetles may be kept with them but they like
to fly at night so must not be kept in long
they are besides very ravenous.

(*Dytiscus marginatus*, Great Water Beetle)

Water scorpions should not be brought in
(readish fly larva). Water boatmen are harmless
& whirligig beetles. Those of a brilliant blue
that swim round & round on the top of the pond.

Water Spider. These are getting very rare & may
be considered a splendid 'find'. This little
animal has its bell-shaped nest of web
attached under the surface of the water to some
pond weed, with the mouth downwards. The spider
travels to the surface to obtain a tiny bubble of
oxygen which it brings down in the hairs of its
body between its legs & introduces into the mouth
of the nest, by turning the tail up. She breathes this
oxygen & in her journey to & fro never gets wet
because she is always enveloped in bubbles.

Nov. 21.

The Animal Kingdom is divided into

Class I. Vertebrate

Class II. Invertebrate : Annulata

Annulata { insects
spiders
millipedes
Crustaceans & worms.

So called because their bodies are composed of rings.

Insects. Bodies cut into ~~two~~ ^{three} divisions in - into : head - thorax - abdomen. The body of a butterfly has three divisions. Head - Thorax - Abdomen.

The Head has one pair of antennae - a pair of eyes on its forehead on the side of the head & mouth & jaws below.

The thorax or chest has the six legs & two pairs of wings.

The abdomen is the hinder part of the body.

Insects undergo metamorphoses

Those of the butterfly are

1. Egg
2. Caterpillar
3. Chrysalis
4. Perfect Insect.

They always have three pairs of legs -

All have one pair of antennae

All breathe by means of holes - tracheae cased with a horny substance, kept open by means of a spiral thread.

Crustaceans or Arthropoda or Jointed-footed animals - (Arthron - a joint Pous - a foot)

Part of the food goes to form a substance called chitin, which is something like horn, & this is deposited in the outer layers of the skin & makes a firm skeleton all over the body & eyes & antennae & legs - within this the soft animal lives.

When the crab grows he has to cast off his old skeleton, & wait till the new one forms itself - He creeps into the darkest corner & there waits. It is a painful process for them because their joints are so small.

When the Hermit crab wants to change, he simply hurls a larger shell on to his old one & gradually works his way into it; he often has a lodger in his shell, & one has been seen to eat the very food out of the Hermit's mouth.

Stages of Crab. Egg. Zoea. Mysis. Pupa.

Bamacle. Acom. Duck-bill.

Acom - shells seen on timber & rock on shore & on shells of shell-fish. e.g. mussel. like half an acorn (Balamas) outer shell has triangular markings. White in colour & appear mostly to be shut up. Whole shell like raised pie - appear to be lipless but really belong to crustaceans. When placed in water - trap-door at top opens & little feelers come out & lash water. These feelers are the legs of the creature - every now & then some little swimming creature is swept into shell. Place specimen in tumbler of artificial salt-water (log. sea salt $1\frac{1}{2}$ pt water) & watch in strong light. Found especially on oyster-shells.

Hairy lashes disappear after a time. Animal is inside, wh: makes shell from carbonate of lime out of its food. head is fastened into its shell "Kicks its food into its mouth" - mouth like proboscis, modified to suit its environment - swollen lips, little palps & jaw serve as lower lip - strong teeth from mouth to gullet - food brought by legs & pushed down. There are numerous & hairy. Has perfect stomach - curved & bent up & has branching liver tubes & glands - is lined with minute cells wh: secrete digesting fluid & turn the minute prey into liquid used as ^{for shell material} nourishment, indigestible parts mixed up with lime & ejected - muscles attached to legs & trap-door apparatus. Side pieces of shell 6 - divided into 6 compartments - 6 broad above & narrow below 6 vice versa - like 12 triangles. Trap-door 4 pieces so arranged as to be left open when required so that feelers can come out. At certain time eggs collect in shell - & are cast out. At once a little free swimming thing comes out - long triangular & shaped body with prolegs at side, front & tail end. swims with hairy legs then grows quiet & changes skin - moults several times

Then assumes perfect form - fixes itself by head
 & sticks on rock - eyes disappear - mouth
 opens - legs free - hinged forth is fixed - repro-
 ductive organs appear - same process is continued.

Prawns, largest size about $2\frac{1}{2}$ inches - not
 counting the antennae - colour of sand exactly -
 & when in sea small black spots.

Pink when boiled. Same happens to other
 Crustacea - (lobsters - crabs & cray-fish)
 owing to colouring pigment in shell.

Prawns abound off sandy shores - square frame
 with net fitted on best for fishing -

Food of prawns - any decaying matter
 like most of Crustaceans.

Mummy - brasse - a kind of fish.

Colouring. Grey. Colour is protective - Soles &
 flounders sand colour for same reason.

Prawns burrow in sand.

Covering horny - also protective -

large plate cover what is apparently head.

Six plates behind & narrow plate running
 along tail - these move easily upon each other

when tail straight out & is suddenly bent
 he goes back - vice versa is pushed forward.
 Under tail are swimmerets.

Upper side of body can be stretched,

under side can be doubled up.

Plates are joined on side nearest head

Head contains the stomach

2nd joint behind head laps out - helps to
 stiffen tail - Every joint has a limb attached
 each is branched & ends in curved & pointed
 tips. Last joint has swimmerets.

Tail fin 3 pieces - 2 flaps - concave piece &
 2 flappers - which serve to propel body.

On under side of apparent head are 5
 pairs of long jointed legs - little tiny rippers
 on 2nd pair - crush on 1st pair.

Large plate of head serves for number of
 things from together to make solid shield

6 organs under head - forming mouth -

work from side to side - jaws are all limbs

two pairs of feelers - long antennae many joints

broad scale like organs make current come

into fish's mouth. Tail portion is muscle

of prawn. Shanks pass from skin to skin.

Eyes rounded knobs placed behind inner feelers -

consist of many lenses placed side by side.

Prawn has spine on head - shrimp has none -
 Gills under scales of head - when alive
 filled with blood

British Trees.

21p94pneu162

The Ash is a native of Britain.

The leaves are compound & arranged in five or six pairs of leaflets opposite to each other along a central leaf stalk. It is disposed to grow tall & stout, but in plantations & woods it grows tall & thin; in parks & lawns it becomes a large & spreading tree. The duration of the Ash is considerable. In Scotland there is an instance of a tree that is nearly 300 years old. It is evident that this tree was well-known to the ancients. Homer speaks of the "mighty ashens spear of Achilles" & Virgil says "the towering ash is the fairest in the woods". In the Swedish Edda the Council of the Gods is said to have been held under the shadow of the sacred ash, "whose branches cover the world". Sometimes the trees grow to great dimensions one having been found in a churchyard in Scotland measuring 58 ft in circumference 5 ft from the ground. Another was found in Galway measuring 42 ft. The Ash leaves hang together at the end of the branch, several in a bunch with one seed at the end.

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The Mountain Ash or Rowan is a small tree or shrub which grows to a height of about 20 ft. It is not related to the Ash, which it does not resemble; it is more nearly related to the pear & apple. The Ancients are said to have made their spears of this wood to defend them from the immortals. In Wales it is considered a sacred tree, there is hardly a churchyard without one. It was also one of the Druids sacred trees, (this may be on account of its red berries). It has been observed to grow most abundantly in the neighbourhood of the ancient circles of stones which are found in N. Britain.

Beech *Fagus sylvatica*. This is a common British tree & is often seen in a dwarf condition in heaths. It is easily known by its smooth bark & light green leaves. The leaf is ovate, with a hardly preserved toothed margin, it is smooth, with parallel veins which proceed immediately to the edge of the leaves. When young there is a delicate silky fringe round the edge of the leaf, this is not seen in an old leaf. The dead leaves may in winter be seen clumping on the branches, not upon the trees. The ground under the beeches is generally bare, owing to the quantity of leaves that accumulate under them. The wood rots easily in the air, but not under water, for this reason it is used for water wheels, buckets etc. The birds nest orchid is a parasite on the roots of the beech - it is so called because it grows in a nest of roots on the beech-root. The nuts of the beech are enclosed in a two-lobed triangular case. The name is taken from the A.S. beoc.

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There is a legend about the forest of St. Leonard which is full of beeches, that when St. Leonard was resting under their shade he was disturbed by the singing of the vipers & the singing of the nightingales. He prayed for their removal & after that it is said -
 "The viper was never known to sing
 Nor the nightingale to sing"

Sycamore (*Acer Pseudo-platanus*).

The leaves are 5-lobed & unequally serrated. The racemes are pendulous. It is often confused with the plane tree, but though the leaves are somewhat similar the trees are really of different characters. The sycamore tree mentioned in the scriptures up which Jacobus climbed was a kind of fig. tree. The maple & sycamore are very closely allied. When young the sycamore forms a massive tree resembling the oak, the leaves make it look heavier than the oak & it gives a denser shade. The young spring leaves are very pretty, showing tints of red, amber & orange, but the leaves become opaque with age. They also become much eaten by insects, & the honey-dew which the aphides exude makes them so sticky that the dust from the roads easily adheres to them & gives them a dirty appearance as summer advances. They shed the bark very early in the autumn, & the autumn tints are very rich & assumed early.

"The sycamore
 Capricious in attire, now green now tawny
 And ere autumn yet has changed the woods
 In scarlet honours bright" (Comper.)

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The wood of the sycamore is yellowish in the mature tree close-grained, but not very hard, therefore easy to work & polish. For this reason it is much used by turners cabinet-makers & makers of musical instruments (particularly violin-makers). It is the best wood that can be used for fuel, burning long & brightly. The sap boils in solution a quantity of sugar, & an attempt has been made in Scotland to manufacture sugar from it, but it has not been successful as a commercial operation. The children sometimes make an incision in the wood & suck the liquor therefrom. Whisky has sometimes been made from the fermentation. There is a sycamore at Kew which is a hundred years old, it is 74 ft. high & its trunk is 5 1/2 ft thick. but in the north there are some specimens of sycamore with trunks exceeding those at Kew. The sycamore becomes covered with small black fungi.

116 Oak Quercus

There are two forms of oak. (1.) That which has the leaf springing without a petiole from the leaf and the acorn with a foot-stalk. (2.) That which has a sessile acorn & leaf with a petiole. In other respects the two oaks are almost exactly similar. The growth of the oak is slower than that of the other native forest trees. The peduncled oak (1.) is generally the most common, but in some districts only the sessile oak is found.

The young trees produce acorns first when they are from 8 to 15 years old, sometimes earlier. The acorns or oak-nuts as they are called collectively, are not used for any purpose except that of the future supply of oak trees. There was when our remote progenitors used them for food.

As time advanced they were abandoned in favour of swine while they became used for food for swine. In early English history the feeding of swine on acorns was referred to under the name of pannage. Evelyn says 1 peck of acorns with a little bran will make a hog increase 1 lb a day for two months together. The names of towns derived from oaks are numerous.

The original Saxon name was *Ac*, but it passed through many variations *ACK. OC. Oxe. Auk. uck. Hoke.* W. was often prefixed. Much in the same way as rustic's say *Woals* for oaks.

With this explanation many names may be seen to come from oak. *Acton. Oak town. Acnigton. Waltham. Woking. Hokenworth etc*

The timber of the oak has had much to do with our maritime greatness, all our large ships being ^{built} ~~made~~ of oak. On account of its durability it has been used for sacred & domestic architecture. The carved shrine of Edward the Confessor in Westminster Abbey now 600 years old is of oak. At Greenstead near Sode Ogar in Essex there is a curious church with walls of oak.

The trees had been split through the centre & pegged together

as a temporary sanctuary for the body of St Edmund. After it was made into a parish church.

Names of famous oaks.

Cowthorpe Oak on the Wold in Yorks.

Linden. Tilia Europea

Smooth Linden best obeys

The Carver's Chisel, best his curious work

Displays in nicest touches

This tree being an inhabitant of towns is often considered a foreign variety. As a matter of fact it has been introduced from the Continent & naturalised in Great Britain. The small-leaved lime tree grows chiefly in Essex & Essex. The most remarkable specimen grows in Kent like the Indian banyan. Its lower branches, borne down by their own weight have drooped to the earth, where they have taken root & sent forth a circle of fresh shoots. Those in their turn have done the same.

The wood is smooth, yellowish-white, soft & smooth grained. It is used by toy-makers, carvers & cabinet-makers, & for the sounding boards of pianofortes as it does not warp under changes of atmosphere. Its quality also recommends it for carriage-panelling. It is preferred for carving to all other wood. Finley Gibbons has used it in St. Paul's, at Windsor & Chatsworth, where it still looks as sharp, delicate & clean as when it first left the Carver's hands.

Bast-matting is a product of the lime being prepared from the inner bark by being soaked in water until it is soft. The honey of the lime is steamed beyond every other kind. In some parts a tea from lime blossoms is said to be a remedy for coughs. The caterpillars that feed upon it are the Lime Hawk moth, the Lobster moth, Buff-tip, Dappled moth, orange moth & Porcelain Beauty.

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112 Elm. *Ulmus Campestris* = Common Elm
Ulmus Montana = Witch Elm or Witch Hazel.

The common elm though so characteristic of English scenery has had its claim as a tree indigenous to English soil disputed. Its well-balanced contour, & fine effects of light & shade in summer & autumn make it a favourite with artists. Its average height is from 40 to 60 ft. The trunk from 4 to 5 ft in diameter.

Near Horsham there is a tree having a trunk 6 ft round at its base, inside the hollow cavity measures 3 ft. The floor is paved with bricks & a door has been cut in the side which is generally kept locked. The timber is used for cart building, & as it is durable in wet & dry, for the keels of ships, planking below the water-line & for water wheels. The leaves were formerly gathered for fodder for swine & cattle.

The leaves remarkable for its uneven base & for its doubly serrated margin.

The chief insect enemy of the elm is a little beetle (*Collytus destructor*) which eats its way in channels between the bark & xylem. Sometimes the channels diverge irregularly from a common centre.

Section of the bark bored by channels of *Collytus destructor*.

In July the female which is



Witch elm

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about $\frac{1}{4}$ inch long, eats its way through the bark & excavates the inner bark, laying eggs all along the track. It then dies, the eggs are hatched & the young grub eat away at right angles, from the chrysalis, then beetles which eat their way out & soon until the whole of the tree is undermined.



(Section of bark eaten by beetle with channels from a common centre. The oak moth also bores long galleries large enough to put one's finger through. The trapping beetle or elm flea devours the foliage. It is a lovely little green & gold insect with well developed head legs. The Cinnabar, a tortoise-shell butterfly frequent the elm & the goat-tailed moth.

Witch or Scotch Elm - distinguished by its growth from the common elm. It is less upright, looser & more spreading. The trunk divides at no great distance from the ground & the leaves are larger & broader. This is the real indigenous elm. Some branches are poisonous & the trunk is valuable to cabinet makers on account of its curious knotty excrescences. On account of the likeness of its name to witch it is often supposed to have magical properties.

"Evermore the tree bows and stoop and lean upon the dusky brushwood underneath
 Their broad curved branches, leaped with clearest green
 New from its silken sheath" Trueman.

Alder (*Alnus glutinosa*) fringes margins of lakes & pools. Most aquatic of our trees. 60 or 70 ft high. Trunk in proportion. Never grows on dry chalky soil. Wood white when standing, flesh coloured when cut. Used by tanner & wood-carver. Clogs & wooden sales of shoes are made of it. Wood soft & of even texture - Sabots made of it. Under water almost imperishable. Therefore valuable for making piles. Piles is on pines of alder.

Ferns

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Soft Frickly Shield Fern (*Polystichum Deutatum*)

Height 18 inches or two feet. Outline spear shaped. Fronds of rusty brown scales. Leaflets glossy green, tapering to a point. Tufts of spore cases form a line on each side of the midrib.

Oak Fern (*Polypodium dryopteris*)

A slender creeping rootstock. Outline of fronds triangular, each branch again triangular. Each branch pinnatifid above, pinnate below. Found in mountainous districts in N. England, Scotland & Wales.

Beech Fern (*Polypodium phegopteris*)

Height 6 to 12 inches. Root stock wiry and creeping. Fronds elongated and triangular. Foot-stalk brittle & twice the length of the fronds. The two lower leaflets turn outwards and downwards, distinguishing this species from any other. It grows in mountainous districts near water.

Mountain Buckler Fern (*Lastrea Montana*) sometimes called Boss Ferns. The spores are arranged round the margins of the leaflets. This is the fragrant mountain fern on account of the sweet odour it exhales when drawn through the hand. The outline is spear-shaped. Foot-stalk very short. Branches diminish upwards & downwards. The lower surface of the frond is covered with minute glands containing the balsamic fluid which produces the sweet odour.

Male Fern (*Lastrea Filix-mas*)

Height 2 ft or more. Most common & robust of the ferns. Rootstock thick as human arm. Scaly footstock. Outline of leaf spear-shaped. Tufts of spore cases on back of leaflets. Outer portion of frond barren.

Spleenworts

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Common wall spleenwort (*Asplenium trichomanes*)

also called Black-spleenwort. Height 4 to 8 inches. Black shining leaf-stalk. Green leaf-lets.

Green spleenwort (*Asplenium viride*) Fronds seldom more than 4 to 6 inches long, stalk green, spores arranged in lines.

Scaly Fern (*Ceterach officinarum*) Rusty back, scaly spleenwort grows in close tuft from scaly root-stalk. Widely distributed on old walls & ruins. Rare in the midland & eastern counties. Formerly had a reputation in medicine. The Arabs still believe in its potency. The scaly fern was among the drugs sent from Tunis to the Exhibition of 1851.

Hard Fern (*Blechnum spicant*). Has glossy stiff leathery fronds of two kinds produced in a dense tuft. Barren fronds are deeply cleft on each side, in the narrow lobes nearly to the midrib. The fertile fronds are divided quite clean to the midrib. The stalk of the barren frond is very short, of the fertile frond very long. The spore-cases are in lines down each side. It grows in heaths, woods and rocky places. There are a great number of varieties.

Bracken (*Pteris aquilina*) 3 to 6 ft in height. One specimen found on Hampstead Heath was 17 ft high. Stem a rhizome. The upper portion of the ~~leaf~~ frond is branched, the branches being produced in pairs. The whole frond is very compound. This fern is very astringent, containing much tannin. It is used in Ireland for bedding for animals, & in England for packing vegetables. Apples keep well in it. Lichen grows on the under surface of the fronds & is often taken for spore-cases. It is really a parasite.

Broad Boss Fern (*Lastrea dilatata*) Foot-stalk thick at the base & covered with spear-shaped scales. The outline of the fronds is usually spear-shaped. Branches feathery. From 14 to 15 varieties.

Filmy Fern (*Hymenophyllum Wilsonii*) very delicate and
so small as to look more like moss than fern.
Grows in clefts & shady rocks & near the spray of
waterfalls - the spore-cases are very interesting.



Poisonous Plants

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Definition of Poison. A substance which can exert by its chemical action an injurious influence on the vitality of a healthy organic body or tissue.

All poisons do not affect all organisms; for instance the deadly night shade & the hemlock do not poison pigs, the water-hemlock is harmless to dogs, dangerous to man & notably so to cattle; the celandine is harmless to sheep.

Poison is represented in the three Kingdoms, animal, vegetable & mineral; it may be divided into three classes by its different modes of action.

- (1) Acrid or Irritant - e.g. Ranunculaceae - opium.
- (2) Narcotics - acting on brain & nerve inducing insensibility. e.g. hemlock & bitter-sweet.
- (3) Narcotic Irritants - e.g. Tobacco, foxglove, cow-bane, deadly nightshade.

Camphor, hyprine, ether, alcohol.

Alkaloids. 1000 in the vegetable Kingdom, but only about 200 well known. Most of them contain violent poisons, among which are nicotine & strychnine.

Ranunculaceae. Very poisonous. Acrid or Narcotic-irritant.

Flowers. Anemone Pulsatilla or Paeony Flower, contains with wood anemone an acid alkaloid which acts as a caustic by blistering the skin.

Upright Meadow Crowfoot (Ranunculus acris.)

Creping Crowfoot (Ranunculus repens)

Buttercup (Ranunculus bulbosus)

Heliborus Lochilus & Vindis

Sarkspur Delphinium Ajacis - Monkshood very deadly.

Papaveraceae Milky fluid narcotic. Opium from incisions in stem of white foreign species. ^{flowers}

Common Red poppy. (Papaver (sturgosum))

Great Celandine (Chelidonium majus)

Leguminosae Pear, Beans, Clivers, Vetches. not very unwholesome.

Laburnum, Toxic - yellow vetch very unwholesome.

Rosaceae Cherries, Plums, strawberries etc. These all produce prussic acid in the kernels of the fruit & in the leaves & flowers of the cherry, plum, & peach. The almond & laurel produce very much.

The oil of bitter almond is very poisonous.

Cucurbitaceae Melon, Cucumber, pump, vegetable marrow, [Bryonia Dioica].

Umbelliferae

Common Hemlock (Conium maculatum) with rough spotted stem. This plant contains an active principle named Conium. It especially kills most animals, but it is said sheep are not injured. It is also said that Conium acts on the nervous system & produces paralysis of the extremities before death. The juice mixed with opium was given to the Athenians & citizens who were condemned to death - e.g. Socrates.

Water Hemlock (Cicuta Virosa) or Cow-bane. It contains a volatile alkaloid (cicutine) harmless to horses & dogs, fatal to cattle & man.

The poison does not develop till the summer months as cows may eat the plant with impunity in the spring. This property is analogous to that of the viper of which the bite is said not to be injurious in cold weather.

122 *Oenanthe fistulosa* - Water Dropwort

Crocata

Phellandrium

There are perhaps the most resembles of the Umbelliferae. The resemblance of the roots of *Crocata* to parsnips, of the leaves of the same & of the *Phellandrium* to parsley & of their shoots generally to celery has led to disastrous results. The poisonous principle resides in the yellowish juice.

Toads Parsley (*Aethusa Cynapium*) odor induces nausea. The plants have been known to give lock-jaw & caused speedy death. They may be known by the three or four lower bractlets hanging from below each lower peduncle.

Compositae

Wall Lettuce (*Lactuca Virosa*) not *L. maritima*

The lettuce secretes a milky fluid, which when exposed to the air becomes vis known as Lactucarium. This plant is probably not poisonous to man but has power as an injection. 3 drops will kill a dog if it is injected in 15 minutes. Some of the Compositae are poisonous to insects, notably the *Chrysanthemum Roseum*.

Ox-eyed Daisy (*C. Coccineum*)

Heal-bane (*Arnica montana*) said to be destructive to fleas.

Solanaceae. This order contains dangerous narcotic properties. It is found in certain parts of the plant when other parts are edible. For example the potato flower-stalk leaves & fruit are poisonous, & the tuber when grown in the light so as to become green. The tomato fruit is edible & the rest of the plant poisonous.

Atropa belladonna : Deadly Nightshade - also called Datura.

This is the best-known among poisonous plants.

The active principle resides in the narcotic alkaloid

is called Atropine. It is present in such large quantities in the berries that a very few have been known to be fatal to a child. Carrying them even will cause temporary paralysis of the hand. *Bella donna* dilates the pupil of the eye.

Solanum dulcamara, & *Solanum nigrum*

Sol: dul: = bittersweet; Sol: nigr: = Common nightshade.

Solanine is present in these in various quantities.

Alkaloid Solanine is most readily obtained from the sprouts of the potatoes.

Hyoscyamus niger : henbane. The Alkaloid is hyoscyamine. It is poisonous to man but not to horses cattle or swine. The leaves & seeds cause stupor and delirium.

Datura Stramonium : Horn Apple. This is not a native of Britain. It has a stupefying smell & is the most poisonous of the Solanaceae. It was used by the sorcerers of the Middle Ages & thus obtained the name Devil's Apple. *Scrophulariaceae*, *Digitalis purpurea* : Foxglove

This is powerfully poisonous; many drugs are prepared from the leaves, the most important being digitaline.

Thymelaeaceae *Daphne Laureola* : Spurge Laurel and *daphne mezereum*. *Coccygnus* comes from the *daphne Laureola*. It is highly poisonous. The *daphne Laureola* has black berries, the *daphne mezereum* red.

Euphorbiaceae Spurge. We have about 16 species representing the species *Euphorbia* - many contain a milky juice. latex or toxic. *Euphorbia lathyris* has a hardseed milky juice - *Euphorbia* - abundant often used instead of capers - hence Capers Spurge.

124 Real capers are the flower buds of *Capparis Spicata* -
they are quite wholesome - but the fruit of the Spurge
is toxic & is, called in French *Wae's Wick*.
Euphorbia Hibernica used by the peasants of Kerry
for stupefying the fish. A small basketful of
crushed leaves will stupefy the fish for a mile or two.
Mercurialis perennis - annua. The mercury
contains a volatile alkalioid - mercurialine.
Persons have been poisoned through eating the
leaves of the Dog's Mercury, but *M. annua* is
sometimes boiled & eaten.
Urticaceae. *Urtica urens* (Common Nettle)
Urtica pilulifera (little stinging Nettle).
The leaves are covered with hairs having silicious
balls. The hairs have hooks or caps which break
off when touched. The hairs enter the skin & the
sap being strongly caustic enters the wounds.
The sap contains formic acid (Coniferae).
It causes a burning pain which soon disappears.
It is very virulent in tropical regions.
Coniferae *Taxus baccata* Yew. Leaves & kernels
of the fruit are highly toxic - they are often fatal.
Juniper *Juniperus Salvia* - poisonous. The tips
of the branches are dried & powdered.
Amaryllideae. *Narcissus* - Daffodils. Snowdrops.
Every part of these flowers especially the
pseudo-narcissus are strongly emetic.
The active principle particularly strong in the bulbs.
Dioscoreae. *Tamus Communis*. Black Bryony.
Powerful acid properties. Death is the result

of medicine from its roots by marks,
Liliaceae *Scilla maritima* - Sea Squill.
A yellowish white powder. Scillitum - a virulent
narcotic poison. Cats, rats, mice particularly
sensitive. *S. nutans* - bulb of common blue
hyacinth very acid.
Colchicum autumnale. The whole plant of
the meadow saffron contains the alkalioid
Colchicine - The seed Sabadille acid.
Aroideae - *Arisaema maculatum*. Stem, leaves
& fruits are intensely acid. The corn also
has this property, but by baking Portland soap
is produced.
Gramineae. *Daniel - Tares* - only one poisonous
species *Lolium temulentum*. The flower has an
unpleasant smell when boiled in water - strong
effervescence - when kneaded makes bad dough.
Wood sorrel, leopard's bane, yellow lead-flax,
Wall pepper, Sundew, Elder, acid lobelia,
hound's tongue, Box, Sorrel, Foxglove, Flag,
Herb Paris - all slightly poisonous.

Antidotes

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The first & most important to be attained in all cases of poisoning is to remove the poison. This is done by the prompt administration of an emetic, the readiest of which are -

Mustard 1 teaspoonful in a tumbler of hot water.

Salt

table

Sulphate of Zinc grains 10-30

or Powdered Ipecacuanha 1 tea. spoonful

followed when vomiting has taken place by copious draughts of warm water to keep up the effect & dilute the poison.

If vomiting cannot be produced the stomach pump should be used, or an india-rubber tube pushed down the back of the throat into the stomach & warm water poured down it - then lower the end of the tube & it will act like a siphon thus emptying the stomach.

The special physiological antidotes to only a few of the vegetable poisonous substances are known; these are -

Poison

Antidote

Aconite & probably all poisonous plants belonging to the Ranunculaceae

Digitalis

Digitalis

Aconite

Opium

Belladonna &

Atropin

Belladonna & Atropin

Solanaceae

Stychnia & Vomica

Opium

Chloroform or Ether (inhalation)

Bromide of Potash

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Hydrocyanic & all poisons Opium & Alcohol
Plants in the Liliaceae

Alcohol

Urine & Caffeine

In addition after an emetic for poisoning by all plants, the dangerous properties of which depend on their containing an alkali (vegetable alkali) administer weak acids (the most handy of which usually are the vegetable acids; in vinegar - acetic acid & in lemon juice - citric acid - or administer fixed oils in large quantities e.g. Castor, Linseed, almond or olive oil - These form soaps with the alkalis & thus destroy their caustic or injurious effects - For plants whose toxic properties depend on a fatty oil, after emetic give weak alkalis in solution e.g. bi-carbonate of soda, Whiting, lime or common Soap dissolved in plenty of warm water or herbal tea.

For all plants of which the poisons are chiefly narcotic after emetic give stimulents Strong coffee, & write & keep up circulation & respiration by cold affusions, friction, Exercise & artificial respiration - & warmth which retards death from narcotic poisoning.

In plants which contain hydrocyanic (Prussic acid) Rosaceae - if there is time antidotes are Cammonia & Chlorine of water also by cold affusion & artificial respiration

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Flower Calendar 1884

February

- 14 Primrose in bud
Celandine
Barren Strawberry
Daffodil

March

- 6th Bitter-cress
Thail-cress
Rue-leaved Saxifrage
7th Golden Saxifrage
Coll's foot
Primrose out
Anemone
Leopard's bane (garden)
Larch
Palm
Maple
Violet
Liver-wort
Bird-cherry.
Ash
Wych Elm.
Daisy

April

- Ground-ivy
Wild Plum
Wild Raspberry
Stitch-wort
Tooth-wort
Garlic
Bilberry
Bog-violet
Marsh-marigold
Sageamore
Beech
Moschatel
Herb-Robert
Herb-Paris
Wood-Sanicle
Wood-ruff
Blue-bell or
Wild Hyacinth
White Milk-wort
Blue Milk-wort
Pink Milk-wort
Bitter-Vetch
Orchis
Yellow Loose-strife
Broom
Bugle
Potentilla repens
Cuckoo-Flower
Water Aweus
Sedge-grass
Crab-apple
Globe Flower
Welsh Poppy
Germander Speed-well.

135 The Progress of Spring

The signs of Spring in nature as mentioned in

Tennyson's poem.

Crocus.

Snow drop

Bee.

Wood. thrush

Lark.

Tits.

Jays.

Woodpecker

Lined

Woodland - Cuckoo

Halcyon

Violet

Brakes

Apricot

Pine

Beech

Peach

Hawthorne

Sea Lily

Primrose

Chestnut

Swallow

Cuckoo

Black. cap

Turtle

Starling

Wood. dove

King - cap

Palms

Cocoa - palm

Scarlet. Cane

Mangrove

Canes.